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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of:

Howard LOWE

Group Art Unit: N/A

Serial No: **10/763,218**

Examiner: N/A

Filed : **January 26, 2004**

For : **A SHUT-OFF VALVE ASSEMBLY**

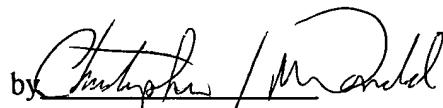
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Sir:

Applicant submits a certified copy of Australian Application No. 2003-903419.
With this submission, claim of foreign priority is perfected.

Respectfully submitted,

by 
Christopher J. McDonald
Reg. No. 41,533

April 28, 2004

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Attorney Docket No. A-8905/CJM:sbs



**Patent Office
Canberra**

I, JULIE BILLINGSLEY, TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. 2003903419 for a patent by HOWARD LOWE as filed on 04 July 2003.

WITNESS my hand this
Twenty-fifth day of March 2004

5

**JULIE BILLINGSLEY
TEAM LEADER EXAMINATION
SUPPORT AND SALES**

Howard Lowe

AUSTRALIA
Patents Act 1990

PROVISIONAL SPECIFICATION

Invention Title: A Shut-off Valve Assembly

This invention is described in the following statement:

The present specification further particularises the shut-off valve assembly as described in the specification of PCT/AU02/00988, the entire contents of which are hereby incorporated by reference. The present specification also describes further preferred forms of the shut-off valve assembly described in the specification of PCT/AU02/00988. It is to be understood that the present specification is to be read together with the specification of PCT/AU02/00988.

As stated in the specification of PCT/AU02/00988, in the broadest form of the invention, there is provided a shut-off valve assembly for regulating the flow of fluid through or from a fluid line, said assembly comprising:

a body attachable to or within a fluid line and having at least one chamber therein with at least one inlet and one outlet for fluid from the fluid line;

15 a valve seat that provides the outlet;

a baffle arrangement located within the chamber;

20 a valve member having a sealing member movable between a shielded position, whereby the sealing member is substantially shielded by the baffle arrangement from a fluid stream moving from said inlet to said outlet, and an unshielded position, whereby the sealing member is movable by the fluid stream against the valve seat to seal the outlet; and

a drive for moving the sealing member between the shielded and unshielded positions.

The broadest form of the invention can be re-stated as follows:

25 A shut-off valve assembly for regulating the flow of fluid through or from a fluid line, said assembly comprising:

a body attachable to or within a fluid line and having at least one chamber therein with at least one inlet and one outlet for fluid from the fluid line;

30 a valve seat that provides the outlet;

a baffle arrangement located within the chamber;

a valve member having a sealing member movable between a shielded position, whereby a fluid stream moving from said inlet to said outlet

is unable to flow between the sealing member and the baffle arrangement, and an unshielded position, whereby the fluid stream can flow between the sealing member and the baffle arrangement and the sealing member is movable by the fluid stream against the valve seat to seal the outlet; and

5 a drive for moving the sealing member between the shielded and unshielded positions.

The baffle arrangement can comprise a baffle housing. The baffle housing can be of any suitable size, shape and configuration. The baffle housing can have a top wall and at least one sidewall, and the sidewall can 10 extend from the top wall towards the valve seat. Preferably, when the sealing member is in the shielded position, the baffle housing is sealed and is airtight. In the unshielded position, fluid from the fluid stream is able to begin flowing between the baffle housing and the sealing member and thus move the sealing member against the valve seat to seal the outlet.

15 The sealing member can be of any suitable size, shape and construction. The sealing member can, for instance, be planar. The sealing member can be disk-shaped, it can have a support disk and it can have a rubber surface facing the valve seat. The rubber surface can be provided by, for instance, a disk of neoprene or like material, or a teflon O-ring.

20 The sealing member can seal the baffle housing in any suitable way. A peripheral region and/or other region of the sealing member can contact and seal the baffle housing when in the shielded position. The point of contact can be within the baffle housing or external of the baffle housing. For instance, a sealing element (e.g. an O-ring) can extend about a periphery 25 of the support disk and seal the baffle housing. The periphery of the support disk can have a groove for receiving the O-ring.

The fluid stream can in some instances consist of liquid, gas or particulate matter having fluid movement (or mixtures thereof).

Any one or more of the above-mentioned features can be present 30 in the preferred forms of the invention described in the specification of PCT/AU02/00988 (if not already described as such) and in the new preferred forms of the invention described herein.

As stated in the specification of PCT/AU02/00988, according to the first preferred form of the present invention, there is provided a shut-off valve assembly for restricting the flow of fluid from a fluid line into a receptacle when the fluid level within the receptacle reaches a predetermined level, said

5 assembly comprising:

a body attachable to a fluid line and having an upper chamber and a lower chamber therein each with at least one inlet and one outlet for fluid from the fluid line;

10 a valve seat that provides the outlet for the upper chamber;
a baffle arrangement located within the upper chamber;

a valve member having a sealing member movable between a shielded position, whereby said sealing member is substantially shielded by the baffle arrangement from a fluid stream moving from the upper chamber inlet to the upper chamber outlet, and an unshielded position, whereby the
15 sealing member is movable by the fluid stream against the valve seat to seal the upper chamber outlet; and

a drive, comprising a float pivotally connected to the valve member, for moving the sealing member between the shielded and unshielded positions,

20 with the construction and arrangement being such that when the float rises with the fluid level in a receptacle to a predetermined level, the sealing member moves to the unshielded position.

The first preferred form of the invention can be re-stated as follows:

A shut-off valve assembly for restricting the flow of fluid from a fluid
25 line into a receptacle when the fluid level within the receptacle reaches a predetermined level, said assembly comprising:

a body attachable to a fluid line and having an upper chamber and a lower chamber therein each with at least one inlet and one outlet for fluid from the fluid line;

30 a valve seat that provides the outlet for the upper chamber;

a baffle arrangement located within the upper chamber;

a valve member having a sealing member movable between a shielded position, whereby a fluid stream moving from said inlet to said outlet

is unable to flow between the sealing member and the baffle arrangement, and an unshielded position, whereby the fluid stream can flow between the sealing member and the baffle arrangement and the sealing member is movable by the fluid stream against the valve seat to seal the outlet; and

5 a drive, comprising a float pivotally connected to the valve member, for moving the sealing member between the shielded and unshielded positions,

with the construction and arrangement being such that when the float rises with the fluid level in a receptacle to a predetermined level, the
10 sealing member moves to the unshielded position.

The valve member can have a stem, the valve seat can have a central opening through which extends the stem, and the stem can extend into the lower chamber. The stem can further extend through the lower chamber outlet.

15 The assembly can have a stem guide located within the lower chamber for guiding the movement of the stem. The stem guide can comprise a sleeve containing a bush, such as a nylon bush, and the stem can extend through the sleeve.

20 The stem guide can seal a lower end of the lower chamber, in which case the stem guide can further comprise a sealing element such as an O-ring through which the stem extends.

If the stem guide seals the lower end of the lower chamber, then the lower chamber outlet can be located at any other suitable location, such as at the sidewall of the body.

25 The drive can be of any suitable construction. Preferably, the drive further comprises a pivot arm that interconnects the stem and float and is pivotable relative to the body. The pivot arm can be of any suitable shape and size, it can be curved or linear. The pivot arm can be connected to the stem and float in any suitable way. The pivot arm can be pivotally connected
30 to any suitable region of the body. The pivot arm can extend through an opening within a sidewall of the body.

As stated in the specification of PCT/AU02/00988, according to the second preferred form of the present invention, there is provided a shut-off

valve assembly for restricting the flow of fluid from a fluid line into a receptacle when a level of fluid within the receptacle reaches a predetermined level, said assembly comprising:

- a body attachable to or within a fluid line and having at least one chamber therein with at least one inlet and one outlet for fluid from the fluid line;
- a valve seat that provides the outlet;
- a baffle arrangement located within the at least one chamber;
- a valve member having a sealing member movable between a shielded position, whereby said sealing member is substantially shielded by the baffle arrangement from a fluid stream moving from said inlet to said outlet, and an unshielded position, whereby the sealing member is in the path of the fluid stream and is movable thereby against the valve seat to seal the outlet;
- a drive for moving the sealing member between the shielded and unshielded positions; and
- a sensor system including a first sensor for sensing the level of fluid within a receptacle,
- with the construction and arrangement being such that when the fluid in the receptacle rises to a predetermined level, the first sensor causes the drive to move the sealing member to the unshielded position.

The second preferred form of the invention can be re-stated as follows:

A shut-off valve assembly for restricting the flow of fluid from a fluid line into a receptacle when a level of fluid within the receptacle reaches a predetermined level, said assembly comprising:

- a body attachable to or within a fluid line and having at least one chamber therein with at least one inlet and one outlet for fluid from the fluid line;
- a valve seat that provides the outlet;
- a baffle arrangement located within the at least one chamber;
- a valve member having a sealing member movable between a shielded position, whereby a fluid stream moving from said inlet to said outlet

is unable to flow between the sealing member and the baffle arrangement, and an unshielded position, whereby the fluid stream can flow between the sealing member and the baffle arrangement and the sealing member is movable by the fluid stream against the valve seat to seal the outlet;

5 a drive for moving the sealing member between the shielded and unshielded positions; and

 a sensor system including a first sensor for sensing the level of fluid within a receptacle,

10 with the construction and arrangement being such that when the fluid in the receptacle rises to a predetermined level, the first sensor causes the drive to move the sealing member to the unshielded position.

15 As stated in the specification of PCT/AU02/00988, according to the third preferred form of the present invention, there is provided a shut-off valve assembly for restricting the flow of fluid through or from a fluid line, said assembly comprising:

 a body attachable to or within a fluid line and having at least one chamber therein with at least one inlet and one outlet for fluid from the fluid line;

 a valve seat that provides the outlet;

20 a baffle arrangement located within the chamber;

 a valve member having a sealing member movable between a shielded position, whereby said sealing member is substantially shielded by the baffle arrangement from a fluid stream moving from said inlet to said outlet, and an unshielded position, whereby the sealing member is in the path 25 of the fluid stream and is movable thereby against the valve seat to seal the outlet;

 a drive that when energised moves the sealing member to the shielded position and when de-energised moves the sealing member to the unshielded position; and

30 a control mechanism for selectively energising or de-energising the drive.

The third preferred form of the invention can be re-stated as follows:

A shut-off valve assembly for restricting the flow of fluid through or from a fluid line, said assembly comprising:

a body attachable to or within a fluid line and having at least one chamber therein with at least one inlet and one outlet for fluid from the fluid
5 line;

- a valve seat that provides the outlet;
- a baffle arrangement located within the chamber;
- a valve member having a sealing member movable between a shielded position, whereby a fluid stream moving from said inlet to said outlet
10 is unable to flow between the sealing member and the baffle arrangement, and an unshielded position, whereby the fluid stream can flow between the sealing member and the baffle arrangement and the sealing member is movable by the fluid stream against the valve seat to seal the outlet;
- a drive that when energised moves the sealing member to the shielded position and when de-energised moves the sealing member to the unshielded position; and
15
- a control mechanism for selectively energising or de-energising the drive.

The term "comprise", or variations of the term such as "comprises" or "comprising", are used herein to denote the inclusion of a stated integer or stated integers but not to exclude any other integer or any other integers, unless in the context or usage an exclusive interpretation of the term is required.
20

Preferred embodiments of the invention will now be described with reference to the accompany drawings in which:
25

Figure 1 is a cross sectional view of a shut-off valve assembly, in an open condition, connected to a tap, according to an embodiment of the invention;

Figure 2 is a cross sectional view of the shut-off valve assembly of
30 Figure 1 but in a closed condition;

Figure 3 is a cross sectional view of a shut-off valve assembly connected to a tap, according to an embodiment of the invention;

Figure 4 is a cross sectional view of a shut-off valve assembly

according to an embodiment of the invention;

Figure 5 is a cross sectional view of part of a shut-off valve assembly in an open condition according to an embodiment of the invention;

Figure 6 is a cross sectional view of the shut-off valve assembly of
5 Figure 5 but in a closed condition;

Figure 7 is a cross sectional view of part of a shut-off valve assembly according to an embodiment of the invention;

Figure 8 is a cross sectional view of part of a shut-off valve assembly according to an embodiment of the invention; and

10 Figure 9 is a cross sectional view of part of a shut-off valve assembly according to an embodiment of the invention.

In all of the drawings, like reference numerals refer to like parts.

Figures 1 and 2 show a shut-off valve assembly 1 for restricting the flow of water from a tap into a sink when the water level within the sink
15 reaches a predetermined level. The assembly 1 is attachable to a threaded end of a tap and basically comprises a body 2, a valve seat 3, a baffle arrangement 5, 27, a valve member 4 and a drive 6, 7, 8.

The body 2 has an upper chamber 11 and a lower chamber 12. Upper chamber 11 has an inlet 14 for water from the tap and a plurality of outlets 16. Lower chamber 12 has a plurality of inlets, which are the same as the outlets 16 of the upper chamber 11, and an outlet 15. The body 2 has a cylindrical sidewall 9 and an end cap 10. The sidewall 9 and the end cap 10 are threaded (not illustrated) for attachment to one another. The end cap 10 has a spout 13, a free-end of which has inlet 14 and is threaded for attachment to the tap. The body 2 comprises brass or plastics material.
25

The valve seat 3 separates the upper chamber 11 from the lower chamber 12 and provides the outlets/inlets 16. The valve seat 3 is made of brass or plastics material and has a surface layer of neoprene 17. The outlets/inlets 16 of the valve seat 3 are primarily located at an outer peripheral region of the valve seat 3.
30

The valve member 4 has a sealing member 18 located within the upper chamber 11 and a stem 19 that extends through a central opening 20 of the valve seat 3 and through the outlet 15. The sealing member 18 comprises

a brass or plastic support disk 21 and has a surface layer of neoprene 22. The neoprene layer 22 faces the valve seat 3. The stem 19 is rod-shaped and is attached to the sealing member 18 with retaining nuts 23. The stem 19 comprises brass or plastics material.

5 The baffle arrangement 5, 27 includes a baffle housing 5. The baffle housing 5 has a top wall 24 and a sidewall 25 extending therefrom. The baffle housing 5 together with the body 2 define passages 26 through which water from the inlet 14 can flow to the outlets 16.

10 The baffle housing 5 has perforated sidewalls 27 that extend between the top wall 24 and end cap 10 and which serve to slow the flow of water to the outlets 16.

15 The assembly 1 has a stem guide 29 located within the lower chamber 12 for guiding the movement of the stem 19. The stem guide 29 has a brass or plastic sleeve 30 containing a nylon bush 31 and the stem 19 extends through the sleeve 30.

The drive 6, 7, 8 comprises a ball float 6, a float arm 7 and a pivot arm 8 for moving the sealing member 18 between a shielded position and an unshielded position.

20 The pivot arm 8 is connected to the stem 19 and is adjustably connected to the float 6. The pivot arm 8 is elongate and is made of brass or plastics material. The pivot arm 8 is adjustably connected to the float arm 7 by a clamp 45. The float arm 7 extends substantially parallel to the stem 19. The float arm 7 is rod-shaped and is made of plastics material.

25 The assembly 1 has a float arm guide 36 connected to the body 2 for guiding the movement of the float arm 7. The float arm guide 36 is connected to the body 2 by a brass or plastic spacer arm 46. The float arm guide 36 comprises a brass or plastic sleeve 37 containing a nylon bush and the float arm 7 extends through the sleeve 37.

30 The pivot arm 8 has a slot (not clearly shown) through which stem 19 extends. A retainer 44 is located each side of the slot. The other end of pivot arm 8 is received and retained within a slot 41 of clamp 45.

The assembly 1 has a deflector 32 located within the lower chamber 12 for deflecting water away from the stem guide 29 and for

ensuring that a strong water stream does not impede movement of the pivot arm 8. The deflector 32 is of general cylindrical shape and has a lower region 33 that flares towards the sidewall 9 of the body 2. The deflector 32 is made of brass or plastics material. The deflector 32 extends from the valve seat 3
5 and the stem guide 29 is located within and connected to the deflector 32.

A sidewall extension 34 is connected to the pivot arm 8 at a point designated by numeral 35 and enables the pivot arm 8 to pivot relative to the body 2.

In use, the distance between the float 6 and the clamp 45 is first
10 adjusted to suit the depth of the sink. This distance determines at what water level the sealing member 18 will seal the apertures 16. The assembly 1 is attached to the sink's tap. The tap is then turned on and water flows through inlet 14, through passages 26, through outlets 16 and through outlet 15. Initially, the sealing member 18 is in the shielded position whereby it is in
15 contact with the baffle housing 5 and seals the baffle housing 5 such that it is airtight. That is, no water can flow between the baffle housing 5 and the sealing member 18, and the sealing member 18 is substantially shielded from the flowing water. This is shown in Figure 1.

As the sink fills with water, the ball float 6 rises, the float arm 7
20 rises, the pivot arm 8 pivots, the stem 19 is pulled downwards by the pivot arm 8, and the sealing member 18 is pulled away from the baffle housing 5 towards the valve seat 3. At this point, water can flow between the sealing member 18 and the baffle housing 5 and there is an increase in water pressure on the support disk 21 of the sealing member 18. This increase in
25 water pressure forces the sealing member 18 against the valve seat 3 and results in the sealing of outlets 16. This is shown in Figure 2.

Referring now to Figure 3, there is shown a shut-off valve assembly
200 that is virtually identical to assembly 1 except with respect to the sealing member 201 and the valve seat 202. The sealing member 201 comprises a
30 support disk 203 and an O-ring 204 extends within a peripheral groove 205 of the disk 203. The valve seat 202 has an O-ring 207 facing the sealing member 201. O-ring 204 seals the baffle housing 206 when the sealing member 201 is in the shielded position.

Figure 4 shows a shut-off valve assembly 300 for restricting the flow of water from a tap into a sink when the water level within the sink reaches a predetermined level. It operates in a similar manner to assemblies 1 and 200.

5 The assembly 300 is attachable to a threaded end of a tap and basically comprises a body 302, a valve seat 303, a baffle housing 305, a valve member 304 and a drive 306, 308.

The body 302 has an upper chamber 311 and a lower chamber 312. Upper chamber 311 has an inlet 314 for water from the tap and a plurality of outlets 316. Lower chamber 312 has a plurality of inlets, which are the same as the outlets 316 of the upper chamber 311, and an outlet 315. The valve seat 303 has an O-ring 395 facing the sealing member 318. The body 302 has a cylindrical sidewall 309 and an end cap 310. The end cap 310 has a spout 313, a free-end of which has inlet 314 and is threaded for attachment to the tap. A spout 317 extends from sidewall 309, a free-end of which has outlet 315.

20 The valve member 304 has a sealing member 318 and a stem 319 that extends through a central opening 320 of the valve seat 303. The sealing member 318 comprises a support disk 380 and an O-ring 381 extends within a peripheral groove 382 of the disk 380.

The baffle housing 305 has a curved top wall 324 and a sidewall 325 extending therefrom. The baffle housing 305 together with the body 302 define passages through which water from the inlet 314 can flow to the outlets 316.

25 A bolt 327 extends transversely through the baffle housing 305 and cylindrical sidewall 309, and nuts 390 hold the baffle housing 305 in position within the upper chamber 311.

The assembly 300 has a stem guide 329 for guiding the movement of the stem 319. The stem 319 extends through an O-ring 331 and an opening 330 of the stem guide 329. The stem guide 329 seals the lower chamber 312 such that water must flow through outlet 315.

The drive 306, 308 comprises a ball float 306 and a pivot arm 308 for moving the sealing member 318 between a shielded position and an unshielded position.

5 The pivot arm 308 is connected to the stem 319 and retainers 346 adjustably connect the float 306 to the pivot arm 308. The position of the float 306 is adjustable so that the predetermined level can be adjusted for different sinks, basins etc.

10 The pivot arm 308 has a slot (not clearly shown) through which stem 319 extends. A retainer 344 is located each side of the slot and they allow for some movement of the pivot arm 308 relative to the stem 319.

An extension 334 of stem guide 329 is connected to the pivot arm 308 at a point designated by numeral 335 and enables the pivot arm 308 to pivot relative to the body 302.

15 In use, the position of the float 306 is first adjusted to suit the depth of the sink. The assembly 300 is attached to the sink's tap. The tap is then turned on and water flows through inlet 314, through outlets 316 and through outlet 315. Initially, the sealing member 318 is in the shielded position whereby it is in contact with the baffle housing 305 and seals the baffle housing 305 such that it is airtight. This is shown in Figure 4.

20 As the sink fills with water, the ball float 306 rises, the pivot arm 308 pivots, the stem 319 is pulled downwards by the pivot arm 308, and the sealing member 318 is pulled away from the baffle housing 305 towards the valve seat 303. At this point, water can flow between the sealing member 318 and the baffle housing 305, and increased water flow over the top of the 25 sealing member 318 forces the sealing member 318 hard up against the valve seat 303.

Figures 5 and 6 show a shut-off valve assembly 500 for restricting the flow of water from a tap into a sink when the water level within the sink reaches a predetermined level. The assembly 500 has most of the features 30 described for assembly 300, except for the fact that the drive includes a pair of solenoids 501, 502 instead of a float.

A casing 504 containing the solenoids 501, 502 is attached to the cylindrical sidewall 309 of the body 302. Each solenoid 501, 501 has a

magnetic coil 505, 506. A rod 507 having a metal bar 508 connected thereto extends through each magnetic coil 505, 506. Retainers 510, 511 connect a lower end of the rod 507 to the pivot arm 308. Retainer 512 is connected to an upper end of the rod 507 and ensures that the metal bar 508 extends 5 through each magnetic coil 505, 506.

Figure 5 shows the shut-off valve assembly 500 in an open condition wherein the sealing member 318 is in a shielded position, whereas Figure 6 shows the shut-off valve assembly 500 in a closed condition wherein the sealing member 318 is in an unshielded position. In use, when solenoid 10 501 is de-energised and solenoid 502 is energised, then the sealing member 318 moves to the shielded position. When solenoid 501 is energised and solenoid 502 is de-energised, then the sealing member 318 moves to the unshielded position whereby it is in a position to be forced against the valve seat 303 by water flowing through the upper chamber 311. When neither 15 501, 502 is energised, the sealing member 318 moves to the unshielded position. Since assembly 500 lacks a float, it may have any suitable sensor system as described in the specification of PCT/AU02/00988.

Figures 7 and 8 are identical to Figures 2 and 3 in the specification of PCT/AU02/00988 except that the sealing member 54 has an O-ring 399. 20 The O-ring 399 ensures that when the sealing member 54 is in the shielded position, the baffle housing 55 is airtight.

Figure 9 is identical to Figure 9 in the specification of PCT/AU02/00988 except that the valve seat 53 has an O-ring 600 and an O-ring 601, 602 is located either side of the valve seat 204 of the housing 202 25 such that there can be a fluid-tight seal between respective valve seats 53, 204 and sealing members 68, 203.

Whilst the above has been given by way of illustrative example of the invention, many modifications and variations may be made thereto by persons skilled in the art without departing from the broad scope and ambit of 30 the invention as herein set forth.

DATED this 4th day of July 2003
HOWARD LOWE
By his Patent Attorneys
CULLEN & CO.

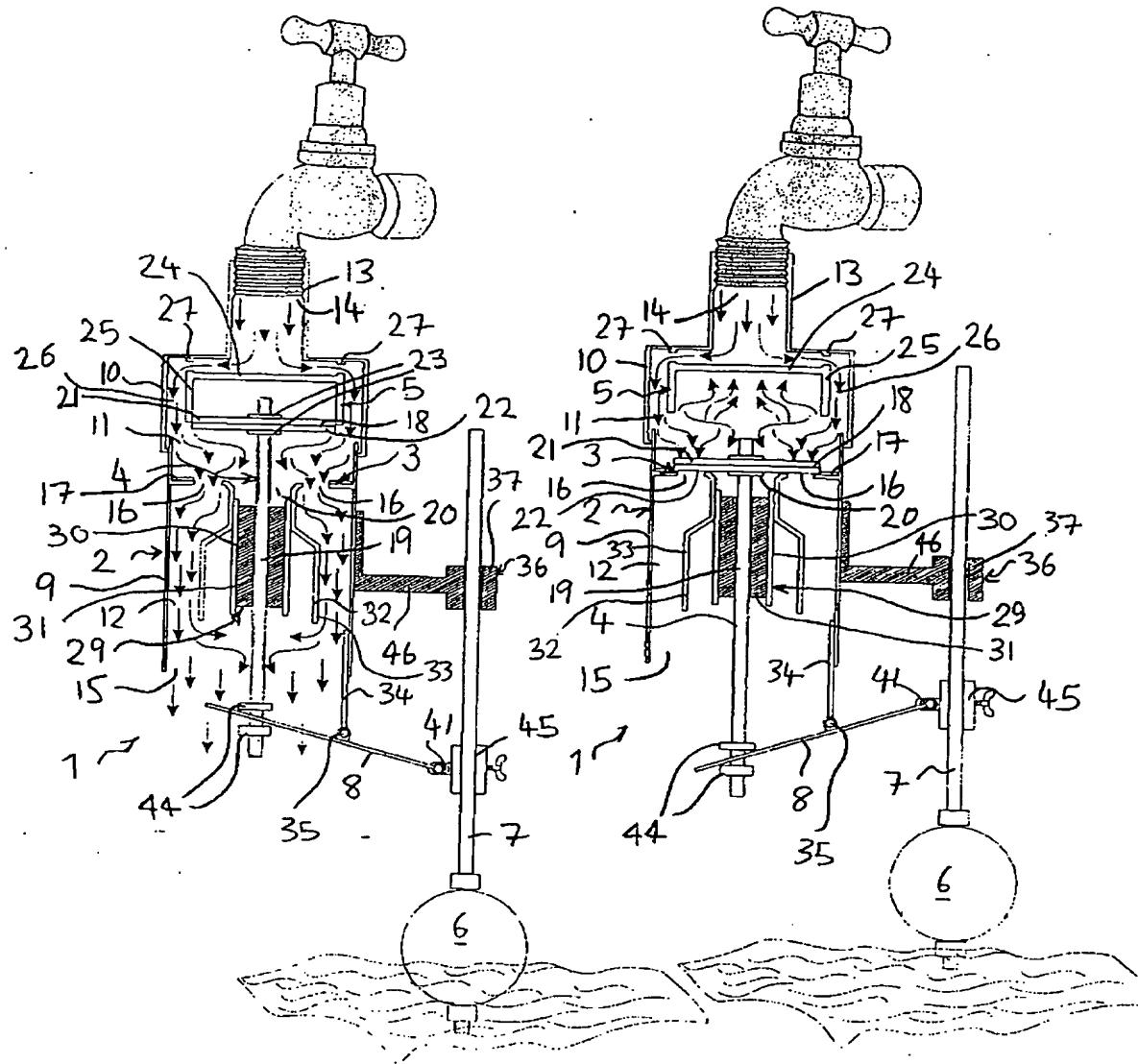


FIG. 1

FIG. 2

216

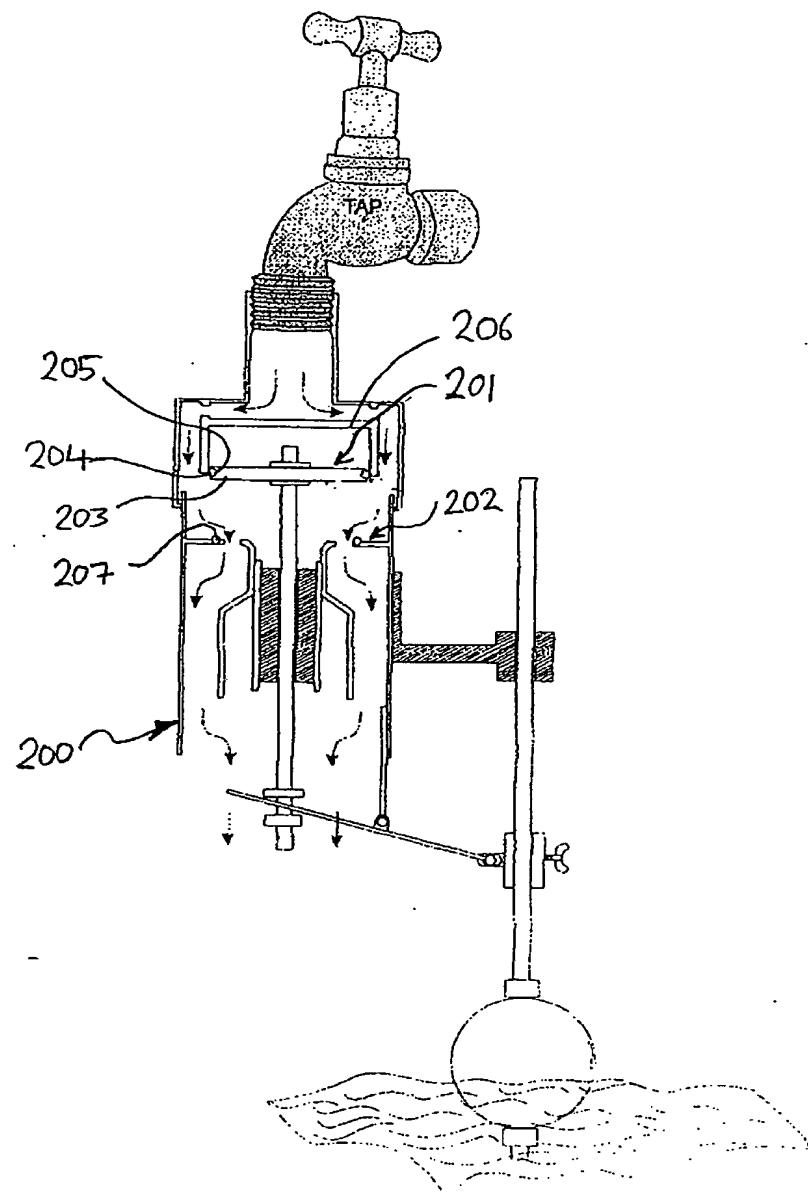


FIG. 3

316

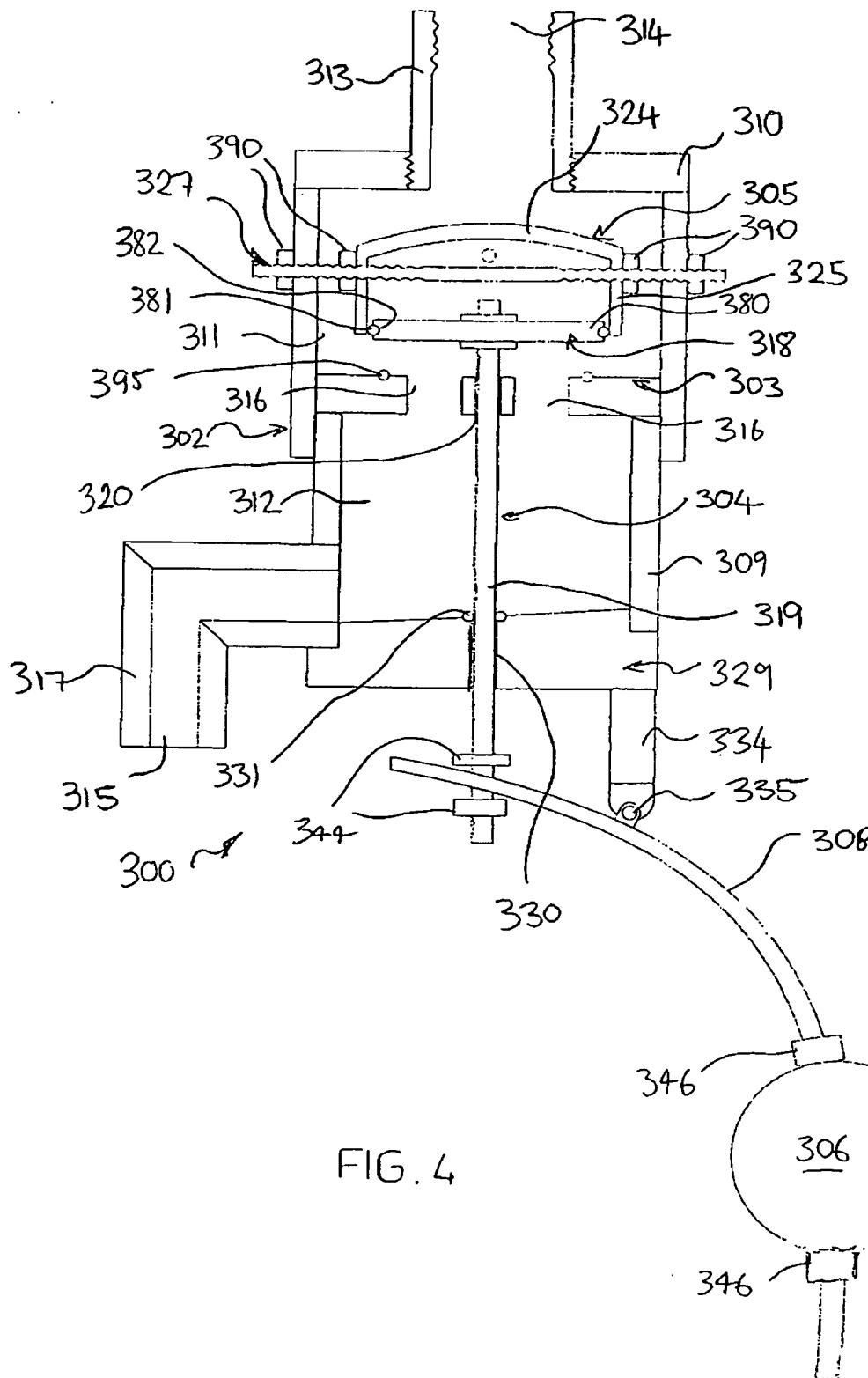


FIG. 4

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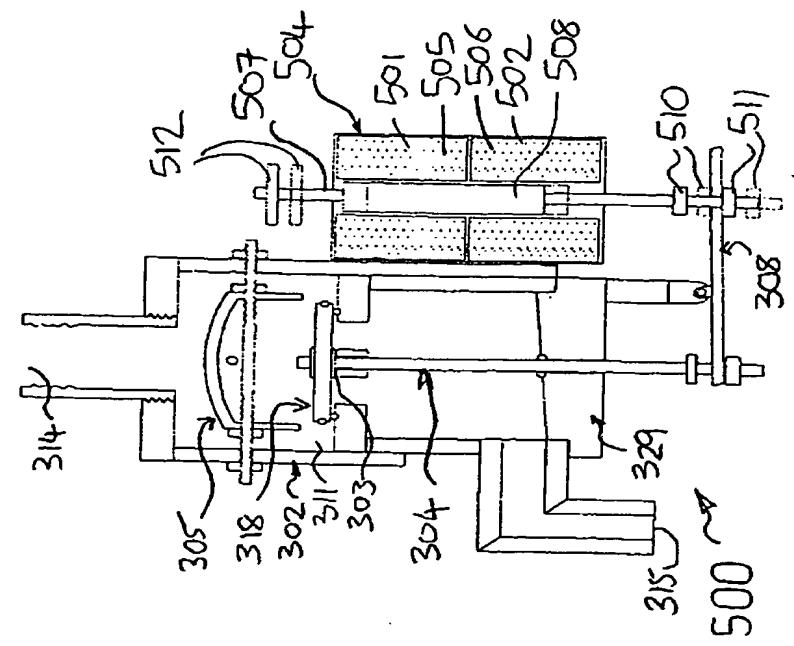


FIG. 6

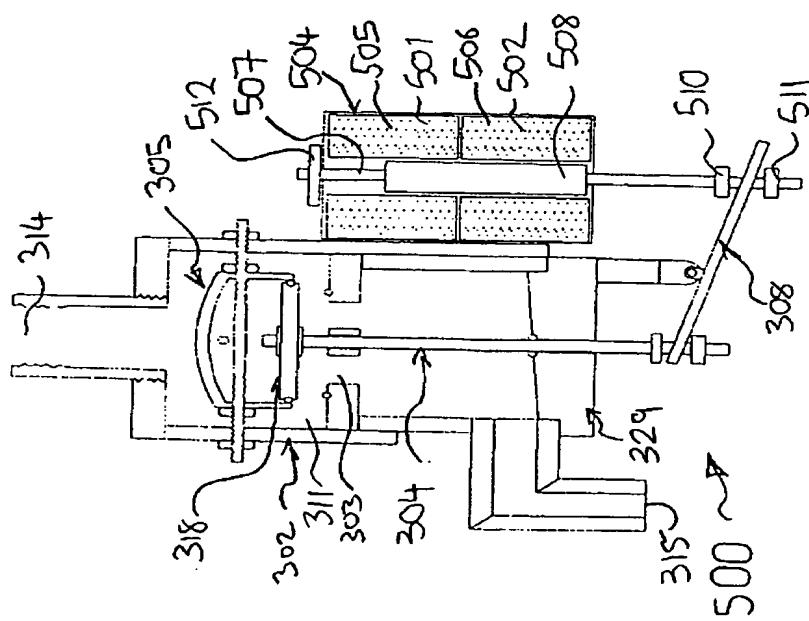
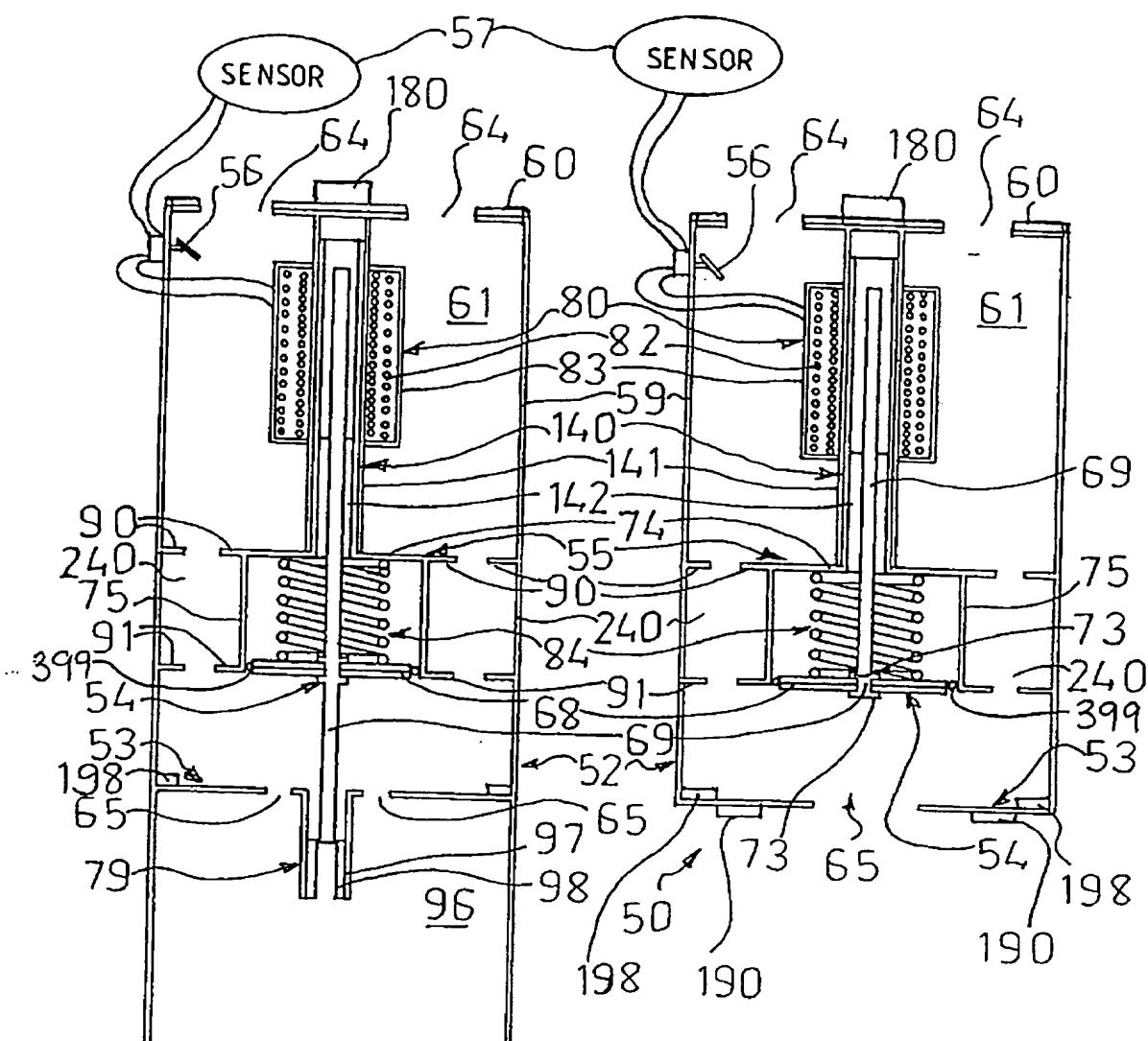


FIG. 5

516



51

FIG.7

FIG.8

616

